most important and interesting herpetological events of recent years." The discovery is primarily due to Mr. F. A. Sampson, who, in July last year, found the adult animal as well as a larva in the Rock House Cave, Missouri, and forwarded both to the U.S. National Museum. Mr. George E. Harris afterwards went to great trouble in order to procure additional specimens. Unfortunately, he has only succeeded so far in obtaining larvæ, but Mr. Stejneger hopes to be able to secure more adults. A more detailed anatomical description of this interesting animal is postponed until then, as he has not felt justified in mutilating the type specimen beyond what was necessary in order to ascertain the character of the vertebræ. The present preliminary description is, therefore, only prepared in order to call attention to the discovery and to supply the diagnosis by which the animal may be identified.

DR. MORRIS GIBBS contributes to *Science* an interesting paper on the food of humming-birds. He has carefully dissected many humming-birds, both old and young, but has never found anything to convince him that the birds live on insects. It may be that at times when flowers are scarce some species of insects are captured, but Dr. Gibbs is satisfied that in season, when flowers are abundant, the ruby-throat of Michigan lives on honey.

IN a recent investigation of the action of accumulators, Herren Neumann and Streintz have shown (*Wied. Ann.*) that lead has the power of absorbing hydrogen. In one case the metal was used as an electrode, and charged with electrolytic hydrogen; in another it was melted, and a current of hydrogen passed through it. Care must be taken that the charged metal is not in contact with air, as the oxygen of the latter then unites with the hydrogen; and this, the authors think, is why previous observers have not been able to prove an occlusion of hydrogen by the lead plates of accumulators. The authors examined other metals, and they give the following numbers for the gas absorbed per unit volume of metal:—Lead, 0·15; palladium, 502·35; spongy platinum, 29·95; platinum black, 49·30; gold, 46·32; silver, 0·00; copper, 4·81; aluminium, 2·72; iron, 19·17; nickel, 16·85; cobalt, 153·00. When the same pieces of metal were repeatedly used, the occluding power generally fell off; in the case of the noble metals this is thought to be due to increased density; but why the occluding power of iron and cobalt should be reduced to one-half or more was not explained. Nickel and copper retained their power. With regard to the high power of cobalt, the authors tried that metal in a voltameter, but curiously it showed no hydrogen polarization when the charging circuit was opened.

MESSRS. WILLIAMS AND NORGATE'S Natural Science Catalogue (No. 9) includes classified lists of books and periodicals on mathematics, astronomy, meteorology, physics, electricity, chemistry, microscopy, optics, mechanics, engineering, technology, &c., in French, German, and other foreign languages.

THE opening meeting of the one hundred and thirty-ninth session of the Society of Arts was held yesterday (Wednesday) evening. The following arrangements have been made for the ordinary meetings:—November 23, "The Disposal of the Dead," by F. Seymour Haden; November 30, "The Copper Resources of the United States," by James Douglas; December 7, "The Chicago Exhibition, 1893," by James Dredge; December 14, "The Utilization of Niagara," by Prof. George Forbes, F.R.S. The following papers, for which dates have not yet been fixed, will be read:—"Transatlantic Steamships," by Prof. Francis Elgar; "The Detection and Estimation of Small Proportions of Inflammable Gas or Vapour in the Air," by Prof. Frank Clowes; "The Purification of the Air Supply to Public Buildings and Dwellings," by William Key; "Pottery Glazes: their Classification and Decorative Value in Ceramic Design," by Wilton P. Rix; "The Chemical Technology of Oil Boiling, with a Description of a New Process for the Preparation of Drying Oils, and an Oil Varnish," by Prof. W. Noel Hartley, F.R.S.; "The Mining Industries of South Africa," by Bennett H. Brough; "Ten Years of Progress in India," by Sir William Wilson Hunter; "Australasia as a Field for Anglo-Indian Colonization," by Sir Edward N. C. Braddon, Agent-General for Tasmania; "Indian Manufactures," by Sir Juland Danvers, late Public Works Secretary, India Office; "Caste and Occupation at the last Census of India," by Jervoise Athelstane Baines, Imperial Census Commissioner for India; "Mexico, Past and Present," by Edward J. Howell; "Newfoundland," by Cecil Fane: "New Zealand," by W. B. Percival, Agent-General for New Zealand. The following courses of Cantor lectures will be delivered on Monday evenings, at eight o'clock: Prof. Vivian Lewes, "The Generation of Light from Coal Gas" (four lectures, November 21, 28, December 5, 12); Dr. J. A. Fleming, "The Practical Measurement of Alternating Electric Currents" (four lectures, January 30, February 6, 13, 20); Prof. W. Chandler Roberts-Austen, F.R.S., "Alloys" (three lectures, March 6, 13, 20); Lewis Foreman Day, "Some Masters of Ornament" (four lectures, April 10, 17, 24; May 1); C. Harrison Townsend, "The History and Practice of Mosaics" (two lectures, May 8, 15). A special course of six lectures, under the Howard bequest, will be delivered on the following Friday evenings at eight o'clock: Prof. W. C. Unwin, F.R.S., "The Development and Transmission of Power from Central Stations" (January 13, 20, 27; February 3, 10, 17).

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysothrix sciurea*) from Guiana, presented by Mrs. K. Betts; a Brown Capuchin (*Cebus fatuellus* ♀) from Brazil, presented by Miss L. Blackburn; a Himalayan Bear (*Ursus tibetanus* ♀) from Burmah, presented by Major W. H. Cunliffe; a Herring Gull (*Larus argentatus*) British, presented by the Rev. Sidney Vatcher; a Goshawk (*Astur palumbarius*) captured at sea, presented by Capt. F. Manley; an Egyptian Vulture (*Neophron percnopterus*) from Africa, presented by Mr. J. L. Teage; two —— Buntings (——) from North Africa, presented by Lord Lilford, F.Z.S.; eighteen Filfola Lizards (*Lacerta muralis* var. *filfolensis*) from the Island of Filfola, eighteen Wall Lizards (*Lacerta muralis* var. *tiliguerta*), an Ocellated Sand Skink (*Sepsocellatus*), a Moorish Gecko (*Tarentola mauritanica*), a Turkish Gecko (*Hemidactylus turcicus*) from Malta, presented by Capt. Robert A. Threshie; a Common Kite (*Milvus ictinus*) from Spain, received in exchange; five Dingos (*Canis dingo*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE NEW COMET.—The weather has prevented observations of the new Comet. Its brightness is about that of the nebula in Andromeda, and it has been suggested that it is a return of Biela's Comet.

COMET BROOKS (AUGUST 28).—The following is a continuation of the ephemeris of Comet Brooks for the present week, extracted from *Astronomische Nachrichten*, No. 312:—

12*h*. *Berlin M.T.*

1892.	R.A. app.			Decl. app.		Log *r*.	Log Δ.	Br.
	h.	m.	s.	°	′			
Nov. 17	10	25	3	−2	35·2			
18		29	40	3	34·7			
19		34	20	4	34·8			
20		39	3	5	35·3	0·0674	9·9568	20·51
21		43	48	6	36·2			
22		48	36	7	37·5			
23		53	27	8	39·0			
24	10	58	20	9	40·8	0·0540	9·9483	22·70

The unit of brightness occurred on August 31.

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The motion of this comet will be noticed from the above ephemeris to be very rapid in a southerly direction, amounting to about 1° per day.

THE LIGHT OF PLANETS.—The question as to whether the light of planets is capable of casting shadows must have, especially during the last few months, been in the minds of many, and perhaps many observations have already been made, but unfortunately not published. With regard to this question, *L'Astronomie* for November contains two notes, the first of which, communicated by M. Marcel Moye on August 30, relates to the planet Mars. His observations were made just before the meridian passage and in a room where the light of the planet could enter the open window. In this way white paper invisible in the corners of the room was easily distinguished when placed on the wall opposite the window, while one could see well the shadows between the fingers of the hand; placing a newspaper in the light of Mars only the place of the table and the number of the words could be recognized, but not read, as was the case with Jupiter. M. Moye concludes then that Mars certainly casts shadows, less strong than those of Jupiter but still appreciable.

In the note on the light of Venus M. Léon Guiot tells us that on August 29, when about to get up to observe Jupiter, he was astonished at the brilliancy of the light that entered his window. Observing his watch, which was hanging on the wall, he was actually able to trace its shadow on the wall, for he says that all was visible as in the light of the moon; one could even read the newspaper. It was about this time that Venus was constantly seen with the naked eye in full daylight.

STELLAR MAGNITUDES IN RELATION TO THE MILKY WAY.—Prof. Kapteyn is the author of an important memoir, which is published in the *Bulletin du Comité International Permanent* pour l'execution photographique de la carte du ciel, relative to an observed systematic difference between the photographic and visual magnitudes of stars depending on their distance from the Milky Way. Prof. Kapteyn first noticed that a difference existed in 1890, but in the present paper he presents a preliminary account of the results he has obtained. The clichés which have been under examination were exclusively those made at the Cape Observatory for the chart mentioned above. In this discussion he has adopted the two following laws: (1) that increasing the time of exposure in the proportion of 1 to 2·5, the fraction of a magnitude gained is 0·7, and (2) the atmospheric extinction of actinic rays rises to 2½ above the visual rays. Since there is an undoubted difference between the photographic and visual magnitudes, denoting this difference by the symbol Δm, the author commences to investigate whether this quantity is ever equal to zero, that is when the photographic and visual magnitudes are equal, and if so to find the locus of these points. Charting the points down on a map and connecting them up by means of curves, the latter are found to follow in a striking manner the path of the Milky Way. Table II. gives the values of Δm obtained from several clichés, and the positive values lie without exception between these two curves, while the negative ones are situated without. Taking into consideration both bright and faint stars, that is stars from the 4th to the 10th magnitude, the author finds that there a strong relation depending on their galalactic latitude exists between them, whether they be even very near or distant from the Milky Way, and the same systematic variation of Δm apparently holds good, being represented by the formula

$$\Delta m = \alpha + \kappa\beta$$

β representing the galalactic latitude and $\kappa = -0^m{\cdot}0099 \pm 0^m{\cdot}0010$.

In seeking for an explanation of the difference, Prof. Kapteyn investigates each possible cause singly. His conclusion, to state briefly, amounts to this, that, if one considers the stellar magnitudes given in the "Uranometrique" and in Gould's "Catalogue of Zones" (it is from these two sources that he has obtained the visual magnitudes) to be correct and not subject to systematic errors amounting sometimes to as much as half a magnitude, then it must be concluded that the light of the stars situated in the Milky Way or in its vicinity is much richer in actinic rays than those at considerable galalactic latitudes. We may remark that the publication of this paper has been purposely hurried owing to the importance of the matter therein, but although sufficient observations have not been taken in account for a very rigid investigation, Prof. Kapteyn hopes to eliminate many of the difficulties and accidental errors by the discussion of clichés of different regions of the sky, differing in galalactic latitudes, made at equal altitudes, on similar plates, with equal lengths of exposure.

THE CANALS OF MARS.—The late opposition of Mars, and the re-observation of the doubling of the canals has brought forward many theories relative to this very curious phenomenon. There seems to be no doubt now that this doubling is not due to instrumental deficiencies, or even to an optical delusion caused by the fatigue of the eyes; but that it is a real observed fact and therefore requires a rigid explanation. Omitting the now well-known hypotheses suggested up till quite lately, the most recent is that put forward by M. Norman Lockyer and which is recorded in NATURE, vol. xlvi. p. 448. Mr. Lebour also (NATURE, vol. xlvi. p. 611) points out the likeness of these markings to the cracks produced in glass broken by torsion, adding that the chief characteristic features in the Mars' lines are there produced. In *Comptes rendus* (No. 18) for October 31 M. Stanislas Meunier relates another possible cause, and illustrates the phenomenon experimentally. The experiment is as follows:—He takes a polished metallic surface and on it traces a series of lines and spots, representing as nearly as possible the Martial surface as seen by us, and illuminates it all by sunlight. He then stretches at some distance (a few millimetres) from it a fine transparent piece of muslin. Looking at the surface through this medium he finds that all the lines and spots are doubled, and, "se germiner par suite de l'apparition, à côté de chacune d'elles, de son ombre, dessinée sur la mousseline par la lumière que le métal a réfléchie." A fact observed by M. Schiaparelli is that the canals when doubled are not always exactly parallel, and that sometimes there is an "aspect de nébulosité." These and other peculiarities are, according to M. Meunier, reproduced by simply undulating the muslin. His explanation is that the solar light is reflected from the planet's surface very unequally, that from the continents exceeding that emitted by the deeper parts, seas and canals. Although the atmosphere is a limpid one, we are unable to see its motions; but if, as he says, the ærial envelope includes a transparent veil of fog at a suitable height, a contrast would be produced, as was the case with the muslin, by the production of shadows "qui pour une œil placé ailleurs que sur le prolongement des rayons réfléchis, à côté de chacune des surfaces peu réfléchissantes, une image pareille à elle." This explanation of the phenomena of shades by reflection if valid should of course hold good for the planet Venus when properly situated, and that it is not observed on the Moon is only another proof that our satellite has no atmosphere.

GEOGRAPHICAL NOTES.

THE *Revue Française* states that a subterranean town, laid out with regular streets in a series of great caverns, near Karki, on the right bank of the Amu-daria, has recently been explored. Pottery and metal work were found amongst the ruins, and from the coins and inscriptions seen the town must have been occupied at least as early as the second century B.C.

BY the new constitution of the United States of Brazil the seat of government is to be transferred from Rio de Janeiro to a site upon the central plateau where an area is to be marked off as a federal district. A scientific mission under Senor Cruls has been appointed to examine the region where the three rivers, Sao Francisco, Tocantins, and Parana, take their rise at an elevation of over 3,000 feet, with the view of finding a suitable site for the new capital.

MR. D. J. RANKIN communicates to the *Scottish Geographical Magazine* an account of his journey up the Zambesi in 1890-91, with a map of the country between the Zambesi and Shire. He found the Zambesi freely navigable for light-draught steamers as far as the Acababassa Falls, more than 300 miles from the sea, the Lupata narrows presenting no difficulty. Between Lupata and Acababassa extensive coal deposits occur, and these are sure to become valuable. Beyond the falls after a portage of about thirty miles, the Zambesi is again navigable

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